Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

5   **Listing of Claims:**

1. (Currently Amended) A method for detecting inter-symbol interference (ISI) and accordingly improving a timing of a detected boundary used for processing a plurality of different symbols, wherein the plurality of different symbols comprise a previous symbol, a current symbol and a following symbol and each of them is

10   composed of a plurality of signals which are respectively transmitted via a plurality of sub-carriers in an OFDM system, the method comprising:

utilizing a first correlator for computing a first correlation value according to a specific signal of the current symbol and a specific signal of the previous symbol, the step of computing the first correlation value comprising:

15   computing a plurality of first conjugated values according to the specific signal of the current symbol;

generating a plurality of first product values according to the first conjugated values and the specific signal of the previous symbol;

generating a plurality of first calculation values with the same sign according to

20   the first product values; and

generating the first correlation value according to the summation of the first calculation values;

utilizing a second correlator for computing a second correlation value according to the specific signal of the current symbol and a specific signal of the following

25   symbol, wherein the specific signals of the previous, current and following symbols are transmitted via the same sub-carrier;

utilizing a comparator for comparing the first correlation value with the second correlation value to determine whether the first correlation value is larger than the second correlation value; and

30   utilizing a timing controller for delaying the timing of the detected boundary when

the first correlation value is larger than the second correlation value due to the timing of the detected boundary being ahead of the timing of an ideal boundary, and advancing the timing of the detected boundary when the second correlation value is larger than the first correlation value due to the timing of

5   the detected boundary lagging behind the timing of the ideal boundary.

2. (Previously Presented) The method of claim 1, wherein the specific signals of the previous, current and following symbols are pilot signals.

10 3-4. (Cancelled)

5. (Previously Presented) The method of claim 1, wherein the specific signals of the previous, current and following symbols are data signals.

15 6-7. (Cancelled)

8. (Currently Amended) The method of claim 1 [[7]], wherein the first calculation values are absolute values.

20 9. (Currently Amended) The method of claim 1 [[7]], wherein the first calculation values are square values.

10. (Currently Amended) The method of claim 1 [[7]], wherein the step of computing the second correlation value comprises:

25 computing a plurality of second conjugated values according to the specific signal of the current symbol;

  generating a plurality of second product values according to the second conjugated values and the specific signal of the following symbol;

  generating a plurality of second calculation values with the same sign according to

30   the second product values; and

generating the second correlation value according to the summation of the second
calculation values.

11. (Previously Presented) The method of claim 10, wherein the second calculation
values are absolute values.

12. (Previously Presented) The method of claim 10, wherein the second calculation
values are square values.

13. (Cancelled)

14. (Currently Amended) An apparatus for detecting inter-symbol interference (ISI)
and accordingly improving a timing of a detected boundary used for processing a
plurality of different symbols, wherein the plurality of different symbols comprise a
previous symbol, a current symbol and a following symbol and each of them is
composed of a plurality of signals which are respectively transmitted via a plurality
of sub-carriers in an OFDM system, the apparatus comprising:
a first correlator for computing a first correlation value according to a specific
signal of the current symbol and a specific signal of the previous symbol, the
first correlator comprising:
a first conjugating circuit for computing a plurality of first conjugated values
according to the specific signal of the current symbol;
a multiplying circuit for generating a plurality of first product values according
to the first conjugated values and the specific signal of the previous symbol;
a first calculating circuit for generating a plurality of first calculation values
with the same sign according to the first product values; and
a first summation circuit for generating the first correlation value according to
the first calculation values;
a second correlator for computing a second correlation value according to the
specific signal of the current symbol and a specific signal of the following

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symbol, wherein the specific signals of the previous, current and following symbols are transmitted via the same sub-carrier;;

a comparator for comparing the first correlation value with the second correlation value to determine whether the first correlation value is larger than the second

5   correlation value; and

a timing controller for delaying the timing of the detected boundary when the first correlation value is larger than the second correlation value due to the timing of the detected boundary being ahead of the timing of an ideal boundary, and advancing the timing of the detected boundary when the second correlation

10   value is larger than the first correlation value due to the timing of the detected boundary lagging behind the timing of the ideal boundary.

15. (Cancelled)

15   16. (Previously Presented) The apparatus of claim 14, wherein the specific signals of the previous, current and following symbols are pilot signals.

17. (Cancelled)

20   18. (Previously Presented) The apparatus of claim 14, wherein the specific signals of the previous, current and following symbols are data signals.

19-20. (Cancelled)

25   21. (Currently Amended) The apparatus of claim 14 [[20]], wherein the first calculation values are absolute values.

22. (Currently Amended) The apparatus of claim 14 [[20]], wherein the first calculation values are square values.

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23. (Currently Amended) The apparatus of claim <u>14</u> [[20]], wherein the second
correlator further comprises:

a conjugating circuit for computing a plurality of second conjugated values
according to the specific signal of the current symbol;

5   a multiplying circuit for generating a plurality of second product values according
to the second conjugated values and the specific signal of the following
symbol;

a second calculating circuit for generating a plurality of second calculation values
with the same sign according to the second product values; and

10   a second summation circuit for generating the second correlation value according
to the second calculation values.

24. (Previously Presented) The apparatus of claim 23, wherein the second calculation
values are absolute values.

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25. (Previously Presented) The apparatus of claim 23, wherein the second correlation
values are square values.

26.   (Currently Amended) ~~The apparatus of claim 14, wherein the apparatus further~~
20   ~~comprises:~~
~~a first equalizing circuit for equalizing the specific signal of the previous symbol;~~
~~a first slicing circuit for slicing the equalized specific signal of the previous~~
~~symbol and providing a first sliced signal for the first correlator;~~
~~a second equalizing circuit for equalizing the specific signal of the following~~
25   ~~symbol; and~~
~~a second slicing circuit for slicing the equalized specific signal of the following~~
~~symbol and providing a second sliced signal for the second correlator~~
~~wherein the first correlator computes the first correlation value according to the first~~
~~sliced signal and the specific signal of the current symbol, and the second correlator~~
30   ~~computes the second correlation value according to the second sliced signal and the~~

~~specific signal of the current symbol.~~ An apparatus for detecting inter-symbol interference (ISI) and accordingly improving a timing of a detected boundary used for processing a plurality of different symbols, wherein the plurality of different symbols comprise a previous symbol, a current symbol and a following symbol and

5   each of them is composed of a plurality of signals which are respectively transmitted via a plurality of sub-carriers in an OFDM system, the apparatus comprising:

a first correlator for computing a first correlation value according to a specific signal of the current symbol and a specific signal of the previous symbol;

10   a first equalizing circuit for equalizing the specific signal of the previous symbol;

a first slicing circuit for slicing the equalized specific signal of the previous symbol and providing a first sliced signal for the first correlator, wherein the first correlator computes the first correlation value according to the first sliced signal and the specific signal of the current symbol;

15   a second correlator for computing a second correlation value according to the specific signal of the current symbol and a specific signal of the following symbol, wherein the specific signals of the previous, current and following symbols are transmitted via the same sub-carrier;

a second equalizing circuit for equalizing the specific signal of the following

20   symbol;

a second slicing circuit for slicing the equalized specific signal of the following symbol and providing a second sliced signal for the second correlator, wherein the second correlator computes the second correlation value according to the second sliced signal and the specific signal of the current symbol;

25   a comparator for comparing the first correlation value with the second correlation value to determine whether the first correlation value is larger than the second correlation value; and

a timing controller for delaying the timing of the detected boundary when the first correlation value is larger than the second correlation value due to the timing

30   of the detected boundary being ahead of the timing of an ideal boundary, and

advancing the timing of the detected boundary when the second correlation value is larger than the first correlation value due to the timing of the detected boundary lagging behind the timing of the ideal boundary.

5   27-28. (Cancelled)